

## **RAW SEQUENCE LISTING**

**The Biotechnology Systems Branch of the Scientific and Technical  
Information Center (STIC) no errors detected.**

Application Serial Number: 09/596,746B  
Source: 1FW16  
Date Processed by STIC: 11/29/05

# ***ENTERED***



IFW16

## RAW SEQUENCE LISTING

DATE: 12/02/2005

PATENT APPLICATION: US/09/596,746D

TIME: 14:18:26

Input Set : A:\26311002001.txt

Output Set: N:\CRF4\12022005\I596746D.raw

```

4 <110> APPLICANT: Raymond J. Dattwyler
5      Gerald Seinost
6      Daniel Dykhuizen
7      Benjamin J. Luft
8      Maria J.C. Gomes-Solecki
10 <120> TITLE OF INVENTION: Groups of Borrelia Burgdorferi and
11      Borrelia Afzelii That Cause Lyme Disease In Humans
14 <130> FILE REFERENCE: 2631.1002-001
16 <140> CURRENT APPLICATION NUMBER: 09/596,746D
17 <141> CURRENT FILING DATE: 2000-06-19
19 <150> PRIOR APPLICATION NUMBER: 60/140,042
20 <151> PRIOR FILING DATE: 1999-06-18
22 <160> NUMBER OF SEQ ID NOS: 86
24 <170> SOFTWARE: FastSEQ for Windows Version 4.0
26 <210> SEQ ID NO: 1
27 <211> LENGTH: 24
28 <212> TYPE: DNA
29 <213> ORGANISM: Artificial Sequence
31 <220> FEATURE:
32 <223> OTHER INFORMATION: Primer
34 <400> SEQUENCE: 1
35 aaagaataca ttaagtgcga tatt                24
37 <210> SEQ ID NO: 2
38 <211> LENGTH: 27
39 <212> TYPE: DNA
40 <213> ORGANISM: Artificial Sequence
42 <220> FEATURE:
43 <223> OTHER INFORMATION: Primer
45 <400> SEQUENCE: 2
46 caatccactt aatttttgtg ttattag            27
48 <210> SEQ ID NO: 3
49 <211> LENGTH: 26
50 <212> TYPE: DNA
51 <213> ORGANISM: Artificial Sequence
53 <220> FEATURE:
54 <223> OTHER INFORMATION: Primer
56 <400> SEQUENCE: 3
57 ttgttagcag gagcttatgc aatatc            26
63 <210> SEQ ID NO: 4
64 <211> LENGTH: 22
65 <212> TYPE: DNA
66 <213> ORGANISM: Artificial Sequence
68 <220> FEATURE:

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## RAW SEQUENCE LISTING

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69 &lt;223&gt; OTHER INFORMATION: Primer

71 &lt;400&gt; SEQUENCE: 4

72 gggcttgtaa gctctttaac tg 22

74 &lt;210&gt; SEQ ID NO: 5

75 &lt;211&gt; LENGTH: 573

76 &lt;212&gt; TYPE: DNA

77 &lt;213&gt; ORGANISM: borrelia burgdorferi

79 &lt;220&gt; FEATURE:

80 &lt;221&gt; NAME/KEY: CDS

81 &lt;222&gt; LOCATION: (1)...(573)

83 &lt;400&gt; SEQUENCE: 5

84 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct 48

85 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser

86 1 5 10 15

88 gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa 96

89 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys

90 20 25 30

92 att acg gat tct aat gcg gtt tta ctt gct gtg aaa gag gtt gaa gcg 144

93 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala

94 35 40 45

96 ttg ctg tca tct ata gat gag ctt gct aaa gct att ggt aaa aaa ata 192

97 Leu Leu Ser Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile

98 50 55 60

100 aaa aac gat ggt agt tta gat aat gaa gca aat cgc aac gag tca ttg 240

101 Lys Asn Asp Gly Ser Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu

102 65 70 75 80

104 tta gca gga gct tat aca ata tca acc tta ata aca caa aaa tta agt 288

105 Leu Ala Gly Ala Tyr Thr Ile Ser Thr Leu Ile Thr Gln Lys Leu Ser

106 85 90 95

108 aaa tta aac gga tca gaa ggt tta aag gaa aag att gcc gca gct aag 336

109 Lys Leu Asn Gly Ser Glu Gly Leu Lys Glu Lys Ile Ala Ala Ala Lys

110 100 105 110

112 aaa tgc tct gaa gag ttt agt act aaa cta aaa gat aat cat gca cag 384

113 Lys Cys Ser Glu Glu Phe Ser Thr Lys Leu Lys Asp Asn His Ala Gln

114 115 120 125

116 ctt ggt ata cag ggc gtt act gat gaa aat gca aaa aaa gct att tta 432

117 Leu Gly Ile Gln Gly Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu

118 130 135 140

120 aaa gca aat gca gcg ggt aaa gat aag ggc gtt gaa gaa ctt gaa aag 480

121 Lys Ala Asn Ala Ala Gly Lys Asp Lys Gly Val Glu Glu Leu Glu Lys

122 145 150 155 160

125 ttg tcc gga tca tta gaa agc tta tca aaa gca gct aaa gag atg ctt 528

126 Leu Ser Gly Ser Leu Glu Ser Leu Ser Lys Ala Ala Lys Glu Met Leu

127 165 170 175

129 gct aat tca gtt aaa gag ctt aca agc cct gtt gtc cat gga tcc 573

130 Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Ser

131 180 185 190

133 &lt;210&gt; SEQ ID NO: 6

134 &lt;211&gt; LENGTH: 191

## RAW SEQUENCE LISTING

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Input Set : A:\26311002001.txt

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135 <212> TYPE: PRT
136 <213> ORGANISM: borrelia burgdorferi
138 <400> SEQUENCE: 6
139 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser
140 1 5 10 15
141 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys
142 20 25 30
143 Ile Thr Asp Ser Asn Ala Val Leu Ala Val Lys Glu Val Glu Ala
144 35 40 45
145 Leu Leu Ser Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile
146 50 55 60
147 Lys Asn Asp Gly Ser Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu
148 65 70 75 80
149 Leu Ala Gly Ala Tyr Thr Ile Ser Thr Leu Ile Thr Gln Lys Leu Ser
150 85 90 95
151 Lys Leu Asn Gly Ser Glu Gly Leu Lys Glu Lys Ile Ala Ala Ala Lys
152 100 105 110
153 Lys Cys Ser Glu Glu Phe Ser Thr Lys Leu Lys Asp Asn His Ala Gln
154 115 120 125
155 Leu Gly Ile Gln Gly Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu
156 130 135 140
157 Lys Ala Asn Ala Ala Gly Lys Asp Lys Gly Val Glu Glu Leu Glu Lys
158 145 150 155 160
159 Leu Ser Gly Ser Leu Glu Ser Leu Ser Lys Ala Ala Lys Glu Met Leu
160 165 170 175
161 Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Ser
162 180 185 190
164 <210> SEQ ID NO: 7
165 <211> LENGTH: 557
166 <212> TYPE: DNA
167 <213> ORGANISM: Borrelia burgdorferi
169 <220> FEATURE:
170 <221> NAME/KEY: CDS
171 <222> LOCATION: (3)...(557)
173 <400> SEQUENCE: 7
174 atg gct tgt aat aat tca gga aaa gat ggg aat gca tct gca aat tct 48
175 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Ala Ser Ala Asn Ser
176 1 5 10 15
178 gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa 96
179 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys
180 20 25 30
182 att aca gaa tct aac gca gtt gtt ctg gcc gtg aaa gaa gtt gag acc 144
183 Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu Thr
184 35 40 45
187 tta ctt gca tct ata gat gaa ctt gct acc aaa gct att ggt aaa aaa 192
188 Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys
189 50 55 60
191 ata ggc aat aat ggt tta gag gcc aat cag agt aaa aac aca tca ttg 240
192 Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser Leu

```

## RAW SEQUENCE LISTING

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193 65          70          75          80
195 tta tca gga gct tat gca ata tct gac cta ata gca gaa aaa tta aat 288
196 Leu Ser Gly Ala Tyr Ala Ile Ser Asp Leu Ile Ala Glu Lys Leu Asn
197          85          90          95
199 gta ttg aaa aat gaa gaa tta aag gaa aag att gat aca gct aag caa 336
200 Val Leu Lys Asn Glu Glu Leu Lys Glu Lys Ile Asp Thr Ala Lys Gln
201          100          105          110
203 tgt tct aca gaa ttt act aat aaa cta aaa agt gaa cat gca gtg ctt 384
204 Cys Ser Thr Glu Phe Thr Asn Lys Leu Lys Ser Glu His Ala Val Leu
205          115          120          125
207 ggt ctg gac aat ctt act gat gat aat gca caa aga gct att tta aaa 432
208 Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Gln Arg Ala Ile Leu Lys
209          130          135          140
211 aaa cat gca aat aaa gat aag ggt gct gca gaa ctt gaa aag tta ttt 480
212 Lys His Ala Asn Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe
213 145          150          155          160
215 aaa gcg gta gaa aac tta tca aaa gca gct caa gac aca tta aaa aat 528
216 Lys Ala Val Glu Asn Leu Ser Lys Ala Ala Gln Asp Thr Leu Lys Asn
217          165          170          175
219 gct gtt aaa gag ctt aca agt cct att gt 557
220 Ala Val Lys Glu Leu Thr Ser Pro Ile
221          180          185
224 <210> SEQ ID NO: 8
225 <211> LENGTH: 185
226 <212> TYPE: PRT
227 <213> ORGANISM: Borrelia burgdorferi
229 <400> SEQUENCE: 8
230 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Ala Ser Ala Asn Ser
231 1          5          10          15
232 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys
233          20          25          30
234 Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu Thr
235          35          40          45
236 Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys
237          50          55          60
238 Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser Leu
239 65          70          75          80
240 Leu Ser Gly Ala Tyr Ala Ile Ser Asp Leu Ile Ala Glu Lys Leu Asn
241          85          90          95
242 Val Leu Lys Asn Glu Glu Leu Lys Glu Lys Ile Asp Thr Ala Lys Gln
243          100          105          110
244 Cys Ser Thr Glu Phe Thr Asn Lys Leu Lys Ser Glu His Ala Val Leu
245          115          120          125
246 Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Gln Arg Ala Ile Leu Lys
247          130          135          140
248 Lys His Ala Asn Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe
249 145          150          155          160
250 Lys Ala Val Glu Asn Leu Ser Lys Ala Ala Gln Asp Thr Leu Lys Asn
251          165          170          175

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## RAW SEQUENCE LISTING

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Input Set : A:\26311002001.txt

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252 Ala Val Lys Glu Leu Thr Ser Pro Ile
253          180          185
255 <210> SEQ ID NO: 9
256 <211> LENGTH: 579
257 <212> TYPE: DNA
258 <213> ORGANISM: Borrelia burgdorferi
260 <220> FEATURE:
261 <221> NAME/KEY: CDS
262 <222> LOCATION: (1)...(579)
264 <400> SEQUENCE: 9
265 atg act tta ttt tta ttt ata tct tgt aat aat tca ggg aaa gat ggg 48
266 Met Thr Leu Phe Leu Phe Ile Ser Cys Asn Asn Ser Gly Lys Asp Gly
267 1          5          10          15
269 aat aca tct gca aat tct gct gat gag tct gtt aaa ggg cct aat ctt 96
270 Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu
271          20          25          30
273 aca gaa ata agt aaa aaa att acg gat tct aat gcg gtt tta ctt gct 144
274 Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu Leu Ala
275          35          40          45
277 gtg aaa gag gtt gaa gcg ttg ctg tca tct ata gat gaa att gct gct 192
278 Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala
279          50          55          60
281 aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat acc gaa 240
282 Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp Thr Glu
283 65          70          75          80
285 aat aat cac aat gga tca ttg tta gcg gga gct tat gca ata tca acc 288
286 Asn Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr
287          85          90          95
289 cta ata aaa caa aaa tta gat gga ttg aaa aat gaa gga tta aag gaa 336
290 Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu Lys Glu
291          100          105          110
293 aaa att gat gcg gct aag aaa tgt tct gaa aca ttt act aat aaa tta 384
294 Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn Lys Leu
295          115          120          125
297 aaa gaa aaa cac aca gat ctt ggt aaa gaa ggt gtt act gat gct gat 432
298 Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp Ala Asp
299          130          135          140
301 gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa ggt gct 480
302 Ala Lys Glu Ala Ile Leu Lys Thr Asn Gly Thr Lys Thr Lys Gly Ala
303 145          150          155          160
305 gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca aaa gca 528
306 Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser Lys Ala
307          165          170          175
309 gct aaa gag atg ctt gct aat tca gtt aaa gag ctt aca agc cct gtt 576
310 Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val
311          180          185          190
313 gtg 579
314 Val
316 <210> SEQ ID NO: 10

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**VERIFICATION SUMMARY**

DATE: 12/02/2005

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TIME: 14:18:27

Input Set : A:\26311002001.txt

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L:920 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:923 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:23  
L:1093 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:1096 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:25  
L:1262 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:1265 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:27  
L:1433 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:1436 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:29  
L:1604 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:1607 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:31  
L:1775 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:1778 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:33  
L:1948 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:1951 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:35  
L:2119 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:2122 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:37  
L:2286 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:2289 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:39  
L:2456 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:2459 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:41